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(54) Title: COMBINING TELEPHONY DATA WITH WEB PAGES DISPLAY
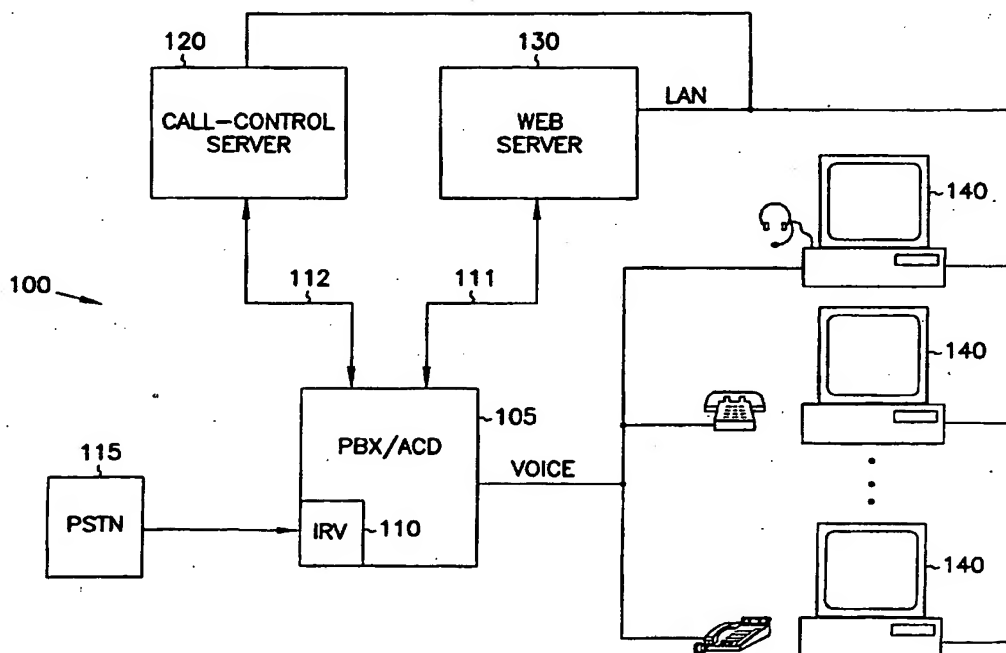
(57) Abstract: A method for combining telephony data display of web browser windows. The method includes gathering telephony data and displaying web browser windows based in part from such gathered telephony data.

COMBINING TELEPHONY DATA WITH WEB PAGES DISPLAY

Technical Field of the Invention

The present invention relates generally to telecommunications and in particular to combining telephony data with display of web pages.

Background of the Invention

The 1990's have produced fundamental changes in the priorities of a call center. Service, quality, and delivery costs are held as prime features of call centers. Increasingly, call centers are viewed as strategic assets having critical system needs. The technology projects within a call center are larger and more complicated. The need for integration and shared application resources has created a new technological focus.

Five basic categories of call center technology have been employed in a typical call center system: automatic call distribution (ACD), interactive voice response (IVR), contact management, computer telephony integration (CTI), and long distance networks. Recently, one popular method of creating customer dialogue has been employing interactive corporate web sites. However, as the volume of web traffic continues to grow exponentially, the process to handle responses to customer communication of this type, in many cases, is under-staffed, or simply ignored. Lower customer satisfaction, reduced customer loyalty, and lost revenue can soon follow.

What is needed are systems and methods for automatically providing call center agents with updated information about products, services, and customers during call center applications.

Summary of the Invention

A method for combining telephony data with display of web browser windows. The method comprises gathering the telephony data from a call, and displaying the web browser windows based at least in part on the telephony data.

In another embodiment, a call center comprises a call control server and a web server. The call control and web servers are operatively coupled to an automatic call distribution system (ACD). The ACD includes a number of ports for receiving telephony data. Electronically and operatively coupled to the web

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server and the ACD is at least one user terminal. The terminal selectively displays a series of web pages based at least in part on telephony data from the ACD.

In yet another embodiment, a method provides for integrating telephony data into web browser windows. The method comprises gathering telephony data, whereupon the telephony data is selectively incorporated into at least one web page. Subsequently, the web browser windows are displayed based at least in part on the telephony data.

Brief Description of the Drawings

Figure 1 is a block drawing of an embodiment of a call center according to the present invention.

Detailed Description of the Invention

In the following detailed description of the preferred embodiments, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration specific preferred embodiments in which the inventions may be practiced. These embodiments are described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that logical, mechanical and electrical changes may be made without departing from the spirit and scope of the present invention. The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is defined only by the claims.

Embodiments of the present invention provide web pages that dynamically react to telephony data. After a call is received and processed within a call center system, information from backend data systems, hereinafter referred to as "data," is integrated into a web page for the call center agent's use. The backend data systems data can be based on a party's network identification number, a call dialed number, or interactive voice response commands.

With embodiments of the invention, customers receive personalized service, since the agent has recent data about the customer, products, and services prior to answering a call. The agent saves time by not having to ask the customer data that is now visible on a web page (e.g., caller's name, account number, etc.). The call center can use conventional web page hit tracking

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mechanisms to understand what callers are calling about. For example, if the agent navigates to the page that provides data about XYZ phone, that fact can be captured by call center statistics packages. Conversely, if the XYZ page is never accessed, the call center staff can take steps to determine the reason the page was

5   not accessed (e.g., the page is difficult to navigate to, customers do not want to buy the XYZ phone, etc.).

The web call guide in embodiments of the present invention is dynamically developed from a collection of HTML documents (web pages). The "homepage" of the call guide accepts data as parameters to the URL. The user

10   operates a browser to access the web page. Embodiments of the invention allow the web call guide to interact with the telephone switch and to determine which telephony data should conditionally pass into the web call guide. When proper conditions are met, software on the agent's computer will invoke the homepage and access the telephony data. Using web technology, for example, ASP, data is

15   retrieved and the browser automatically navigates to the correct page. Upon completion of a call, i.e., the customer hangs up, the web call guide automatically navigates to the homepage and awaits the next call.

In one embodiment, the present invention provides a server-based scripting solution that provides updated information to numerous users. The

20   server-based scripting solution is implemented using a standard HTML technology. In another embodiment, the invention provides a sole master script that is accessible by multiple users. In this example, if the master is modified, all users see the modification.

A call center agent (CCA) provides a plurality of web browser windows

25   that operate within a single application framework. Each of these web browser windows is controlled by an underlying telephony and data engine. These two engines independently supply the web browser windows with information about the state of telephone calls (offering, answered, and released); data associated with calls (e.g., caller number, called number, call ID, trunk information, IVR

30   data, active telephone extension and device name); environmental information (e.g., time zone of user and software version); and call center agent data (e.g., user ID and language preference). The web browser windows reside in the CCA framework, and can be displayed in a variety of ways.

In one embodiment, the windows are aligned as tabs along the bottom of the CCA's graphical user interface "GUI". Under this configuration, only one window is visible at a time.

In another embodiment, the windows are arranged such that one or more windows are predominantly visible. Windows of this type may be "docked" horizontally or vertically. Any remaining windows are arranged as tabs.

Windows float above other windows in another embodiment. This configuration is referred to as an "always-on-top" mode.

In addition to display embodiments, the system provides for simple, yet powerful integration with web based applications. The CCA regards each web browser window as a URL. Understanding how and when to pass the telephony data to the web browser windows is a function of the CCA. In one embodiment, the URLs may reference web documents that exist anywhere. In other embodiments, the URLs exist on the CCA server (which may also contain web server software), on Intranets or local area networks, "LANs," or web servers across the Internet. The URLs may contain any valid web page software or format (e.g., ASP, HTML, PERL, CGI, VB Script, Java Script, Java, ActiveX, etc.).

In one embodiment, URLs are integrated into CCA windows. From the administration web pages, an administrator chooses the URLs the users should have access to. For each URL, the telephony events that the URL should act upon are chosen. For example, a specific URL may only receive data on a call offering. In contrast, a second URL receives data on a call offering and a call release. Configuring the URL's appearance as a window to each user is the final step. The user will see the converted URL as a window during the user's operation of the CCA application.

The surrounding CCA GUI contains a screen-based telephony window. The screen-based telephony window provides functionality to make, release, hold, conference, and transfer calls. Additionally, the interface provides ACD functionality such as login, logout, ready, not ready, make set busy and make set in-service. The telephony window can be "docked" within the application or it can float above the web browser tabs.

Embodiments of the present invention advantageously provide combining multiple browser windows in a single application with telephony data and other data selectively incorporated in each page. In this manner, an application emerges that incorporates telephony data into web pages for what

5   appears to the user as a "seamless" application.

Figure 1 is a simplified block diagram of a call center 100, according to one embodiment of the present invention. The call center 100 includes a call distribution center 105 that receives and transmits calls utilizing an Integrated Voice Response Unit (IVR) 110 and a public switched telephone network

10   (PSTN) 115. The IVR 110 receives incoming calls from the PSTN 115. The IVR 110 can reside as part of the distribution center 105, or alternatively the IVR 110 can exist as a stand-alone device. In other embodiments of the present invention, the IVR 110 is not present at all.

Generally, the distribution center 105 communicates over interconnects

15   112 and 114. The interconnects 112 and 114 transmit signals to a call control server 120 and a web server 130. In another embodiment, the web server 130 may reside together with the call control server 120. Furthermore, the web server 130 controls the web pages that ultimately become a part of the window display on a call center agent's computer 140.

20   Using embodiments of the present invention, web technology allows scripts to react in ways that static documents cannot. The following example describes the workflow for one embodiment of the invention, as depicted in Figure 1. A customer in Montreal calls 1-800-For-Nortel. The call is answered by an IVR 110 to gather information about the caller. For example, IVR 110

25   prompts caller to enter a language preference and a seven digit account code. Customer selects French (by pressing 1) and enters account code of 1234567. IVR 110 notifies Computer Telephony Integration server (CTI) 120, (i.e., a type of call control server as defined above), of customer's language preference and account code. IVR 110 routes the call to Automatic Call Distribution system

30   (ACD) 105 which queues the call for the next available French-speaking agent. Thereafter, the ACD system 105 routes the call to a terminal of a French-speaking agent. The CTI Server 120 notifies software on the agent's computer, "Web Call Guides," of the incoming telephone call. Additionally, the

CTI server 120 notifies "Web Call Guides" of both the calling number and called number. The CTI server recognizes this call as having been previously on the IVR unit 110, and passes the IVR information (e.g., language and account number) to the "Web Call Guides" application running on the agent's computer.

5 Subsequently, the "Web Call Guides" application retrieves the CTI data from the CTI server 120.

"Web Call Guides" utilizes the called number (1-800-For-Nortel) to determine which URL (web page) to pass to a web browser (e.g., Microsoft Internet Explorer). Along with the URL, "Web Call Guides" creates a "Query

10 String" that includes the customer's calling number, the called number and the IVR digits. The web browser navigates to the web page (as referenced by the URL) selected by "Web Call Guides" (e.g., web page for Nortel sales). The Hypertext Markup Language (HTML) of the web page retrieves the calling number, called number and IVR digits from the "Query String." In one

15 embodiment, the HTML uses the "Query String" data to react as follows:

The IVR data notifies the web page that an agent is speaking to a French-speaking customer and all web page text should be displayed in French. The web page performs a database search using the customer's account number and displays information about the customer on the web page (e.g., Name,

20 Address, Account Balance, Home Phone Number, Business Phone Number, etc.).

The web page compares the calling number with the phone numbers stored in the customer's database record, and displays a message on the web page notifying the agent where the customer is calling from (e.g., home or

25 business). The agent uses the web page to guide the customer through the call. When the caller hangs up, the software, "Web Call Guides," instructs the web browser to navigate to an agent wrap-up page, thus allowing the agent to record information about the call. When the agent finishes with a wrap-up, "Web Call Guides" awaits the next incoming call.

30 "Web Call Guides" are created with off-the-shelf web page development tools (e.g., Microsoft's Front Page). In some embodiments, "Web Call Guides" execute on a web server 130. "Web Call Guides" may integrate telephony data and the Internet to provide an enterprise solution. For example, passing data

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gathered from the telephone system to a web page for purposes of data retrieval, display, and web page navigation. Such data may encompass the calling number, the called number, IVR digits, a unique switch call ID, etc.

5   In another embodiment, off-the-shelf web design tools (e.g., Microsoft Front Page) are used to create workflow management documents. In such an embodiment, web pages react in some fashion (e.g., navigating) to different telephony events, such as: Call alerting, Call answered, Call released, etc. In other embodiments, web pages include an ability to screen calls based on several variables. In an embodiment of this sort, web pages screen out internal calls or

10   take different actions depending on the time of day.

An advantage of the present invention is that telephony data and other data are dynamically incorporated into a web page format at a call center agent's computer. A web-optimized call center allows multiple web browser windows to operate within a single application framework.

15   An advantage of the above web browser windows is that each web browser window is controlled by an underlying telephony and data engine. Advantageously, the telephony and data engines independently supply the web browser windows with information about the state of telephone calls (offering, answered, and released), data associated with calls (caller number, called

20   number, call ID, trunk information, IVR data, active telephone extension and device name), environmental information (time zone of user and software version), and call center agent data (user ID and language preference).

Another advantage of the present invention includes methods or systems that make web-based customer dialogue as easy as responding to a telephone

25   call, thus allowing call center agents to efficiently manage all web-based text inquiries.

Conclusion

While various embodiments of the present invention have been described above, it should be understood that they have been presented by way of example, and not limitation. Thus, the breadth and scope of the present invention should

30   not be limited by any of the above-described exemplary embodiments, but should be defined only in accordance with the following claims and their equivalents.

What is claimed is:

1.   A method for combining telephony data with display of web browser
windows, the method comprising:

5   gathering the telephony data from a call; and

        displaying the web browser windows based at least in part on the
telephony data.

2.   The method of claim 1, wherein gathering the telephony data from a call
10   comprises answering the call using an integrated voice response unit "IVR,"
wherein the IVR has IVR data.

3.   The method of claim 1, and further comprising gathering other data for
the web pages.

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4.   The method of claim 2, and further comprising:
        notifying a computer telephony integration server (CTI) of the plurality
of responses such that the CTI has CTI data of the call; and
        routing the call to a call distribution system.

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5.   The method of claim 4, and further comprising:
        prioritizing the call for a next available user; and
        routing the call to an appropriate available user.

25   6.   The method of claim 4, and further comprising:
        notifying a computer program on a user terminal of the call;
        passing the IVR data to the computer program; and
        storing the CTI data for retrieval by the computer program, where in the
CTI data and the IVR data are different.

30

7.   The method of claim 6, wherein retrieval by the computer program of the
CTI data comprises:
        selecting the web page based on the telephony data;

passing the selected web page to a web browser on the user terminal; and

creating a query string, including at least some of the telephony data to be used in dynamically displaying the web page.

5   8.   The method of claim 7, wherein creating the query string comprises:

creating the query string to include a customer's calling number for usage by the web page.

9.   The method of claim 7, wherein creating the query string comprises:

10   creating the query string to include a customer's called number for usage by the web page.

10.   The method of claim 7, wherein creating the query string comprises:

creating the query string to include IVR digits for usage by the web page.

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11.   The method of claim 7, and further comprising:

customizing the web page text from a customer database, and displaying customer information on the web page.

20   12.   The method of claim 1, wherein displaying web pages includes navigating to a user wrap-up page at the end of the sequence of web pages.

13.   A call center, comprising:

a call control server;

25   a web server;

an automatic call distribution system (ACD) operatively coupled to the call control and web servers, and wherein the ACD includes a number of ports for receiving telephony data; and

at least one user terminal electronically and operatively coupled to the

30   web server and the ACD, and wherein the terminal selectively displays a series of web pages based at least in part on telephony data from the ACD.

14.   The call center of claim 13, wherein the user terminal includes a graphical user interface that displays a telephony window for choosing functional call features.

5   15.   The call center of claim 13, wherein the user terminal includes browser-based software for selectively navigating through web pages based on the telephony data.

16.   The call center of claim 14, wherein the telephony window includes a

10   feature for docking within a user application.

17.   The call center of claim 14, wherein the telephony window comprises at least one engine for supplying the telephony window with call information.

15   18.   The call center of claim 17, wherein the engine comprises a data engine controlling the telephony window.

19.   The call center of claim 17, wherein the engine comprises a telephony engine controlling the telephony window.

20

20.   A method for integrating telephony data into web browser windows, the method comprising:

        gathering the telephony data;

        selectively incorporating the telephony data into at least one web page;

25   and

        displaying the web browser windows based at least in part on the telephony data.

21.   A call center comprising:

30   a call control server;

        a web server;

        means for gathering telephony data from a call to the call center; and

means for displaying web browser windows based at least in part on the telephony data.

22.   The call center of claim 21, further comprising means for creating a query string including the telephony data for use by the web browser windows.

23.   The call center of claim 21, further comprising:

means for prioritizing the call with respect to other calls; and

means for routing the call to an appropriate available user.

24.   The call center of claim 21, further comprising means for navigating through the web browser windows based on the telephony data.
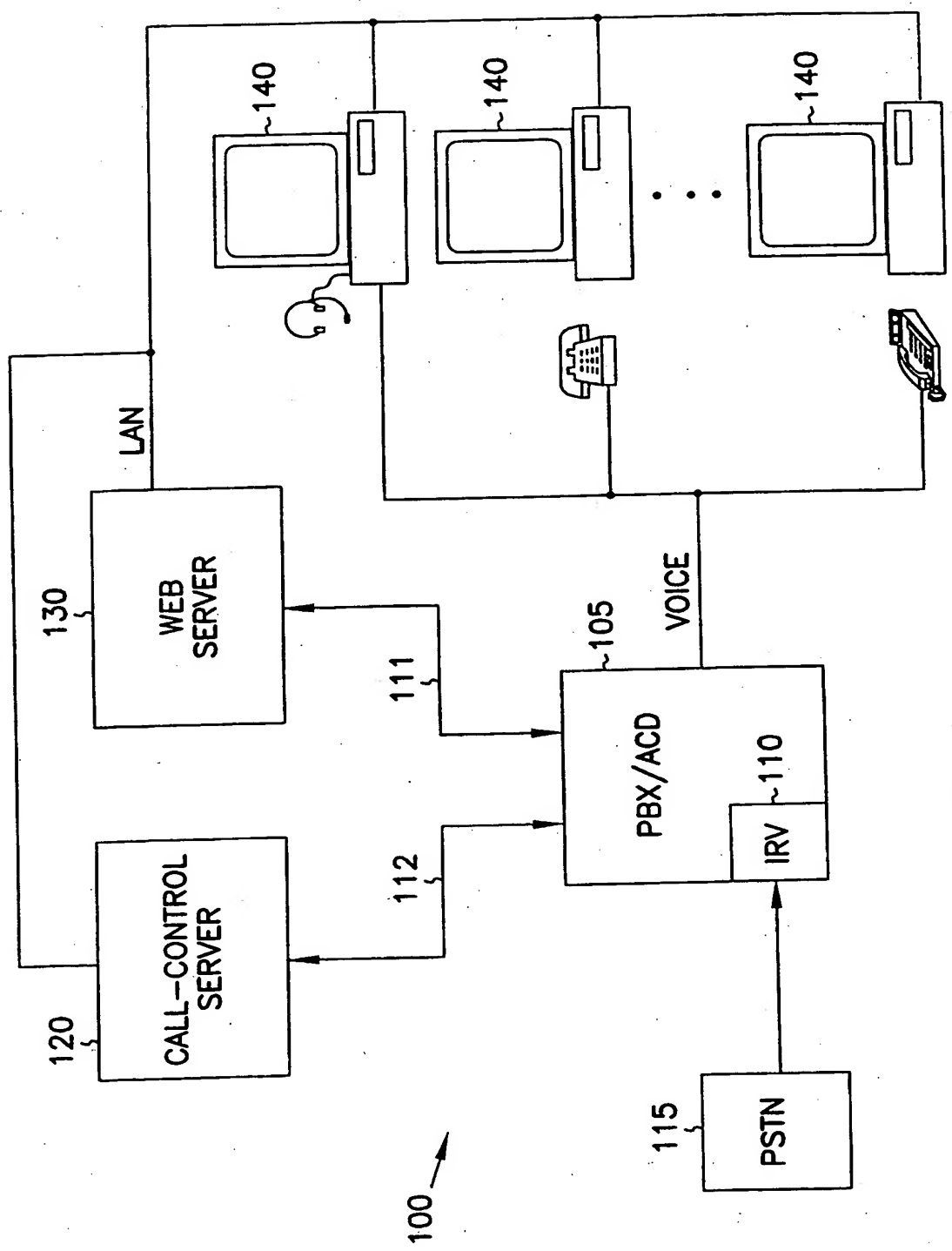
FIG. 1

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   H04M3/523   H04M3/51   H04M7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7   H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC, IBM-TDB, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 20667 A (TELOQUENT COMMUNICATIONS CORP) 14 May 1998 (1998-05-14) abstract page 1, line 13 -page 2, line 30 page 6, line 8 -page 7, line 26 page 8, line 25 -page 12, line 28 ---	1,3,4, 13,14, 16-18, 20-22,24
X Y	WO 97 12448 A (EDIFY CORP) 3 April 1997 (1997-04-03) abstract page 1, line 15 -page 3, line 2 page 5, line 7 - line 18 --- -/--	13-15, 17,18 1-4,6-8, 11, 20-22,24

[X] Further documents are listed in the continuation of box C.	[X] Patent family members are listed in annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
22 September 2000	04/10/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Willems, B

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INTERNATIONAL SEARCH REPORT

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 97 10667 A (EDIFY CORP) 20 March 1997 (1997-03-20) abstract page 2, line 5 - line 24 page 4, line 28 -page 5, line 2 page 4, line 32 -page 6, line 35 ---	1-4,6-8, 11, 20-22,24
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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